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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/805,947	03/22/2004	Michael W. Morrow	80107.112US1	1043

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EXAMINER

MOLL, JESSE R

ART UNIT PAPER NUMBER

2181

DATE MAILED: 04/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/805,947	<b>Applicant(s)</b> MORROW, MICHAEL W.	
	<b>Examiner</b> Jesse R. Moll	<b>Art Unit</b> 2181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 July 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

*Handwritten:*  
Fritz Fleming  
Supervisory/PRIMARY EXAMINER  
GROUP 2100  
4/14/2006  
Hu 2181

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>22 July 2004</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1-25 have been examined.

Acknowledgment of papers filed: oath, specification, drawings on 22 March 2004, and IDS on 22 July 2004. The papers filed have been placed on record.

### ***Specification***

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because it does not adequately describe the disclosure. Examiner requests that the abstract include the main concept of the claimed invention such as overriding a static prediction with a dynamic prediction. Correction is required. See MPEP § 608.01(b).

3. The title is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: "A Hybrid Branch Predictor Using A Small Capacity Dynamic Predictor To Override A Static Predictor".

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4 and 6-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Henry et al. (U.S. Patent No. 6,247,122 B1) herein referred to as Henry.

6. Regarding claim 1, Henry discloses a method comprising: performing a static branch prediction (Static Prediction 382; see fig. 3; col. 9, lines 37-40) for a branch; and overriding the static branch prediction (see col. 9, lines 53-56) with a dynamic branch prediction (Agree/Disagree Prediction 381; see fig. 3; col. 9, lines 1-4) when the static branch prediction has previously been incorrect (see col. 10, lines 43-53);

*Note that if the static branch prediction had been previously incorrect, the table would show that the last time that branch was encountered; the executed branch disagreed with the static predictor. Therefore, the entry would indicate to the dynamic predictor to disagree the next time the branch is encountered.*

Wherein the static branch prediction and dynamic branch prediction are performed in a single pipeline stage (Translate Stage; see col. 7, lines 37-40).

7. Regarding claim 2, Henry discloses the method of claim 1 wherein the static branch prediction comprises predicting taken or not taken based on a direction of the branch (see col. 8, lines 55-58).

*Note that the sign of the displacement determines the direction of the branch.*

8. Regarding claim 3, Henry discloses the method of claim 2 wherein predicting taken or not taken comprises predicting based on a displacement field of a branch instruction (see col. 8, lines 55-58).

9. Regarding claim 4, Henry discloses the method of claim 1 wherein the static branch prediction comprises: determining the direction of the branch (see col. 9, lines 34-37);

*Note that the sign of the displacement determines the direction of the branch.*

And if the direction of the branch is backward, then predict taken (see fig. 9).

10. Regarding claim 6, Henry discloses the method of claim 1 further comprising: overriding the static branch prediction with a dynamic branch prediction when the dynamic branch prediction has previously been incorrect (see fig. 11; col. 10, lines 48-53 regarding updating the history table after branches are executed).

*Note that if the static predictor is incorrect and the dynamic predictor agrees, the dynamic predictor is also incorrect. This will cause the dynamic predictor to override the static predictor the next time the branch is encountered.*

11. Regarding claim 7, Henry discloses the method of claim 1 further comprising updating the dynamic branch prediction when the static branch prediction is incorrect (see col. 10, lines 48-53 regarding updating the history table after branches are executed).

12. Claim 8 recites equivalent limitations as claim 1, but as a processor and adding the limitation "whether a branch is taken or not taken" which is anticipated by Henry (see col. 9, lines 45-50). All other limitations are rejected under the same grounds as claim 1.

13. Claim 9 recites equivalent limitations as claim 4 and is therefore rejected under the same grounds.

14. Regarding claim 10, Henry discloses the processor of claim 8 wherein the static branch predictor includes a circuit to predict the branch will be taken when the direction of the branch is forward (see fig. 9).

*Note that if the branch instruction (from claim 1) is in the taken subset, the branch will always be predicted taken.*

15. Regarding claim 11, Henry discloses the processor of claim 8 wherein the dynamic branch predictor includes a plurality of entries (see fig. 5) to hold branch prediction information for branches having had incorrect static predictions (see col. 10, lines 43-53).

*Note that entries are held for both incorrect and correct static predictions.*

16. Regarding claim 12, Henry discloses the processor of claim 11 further comprising a branch execution unit (ALU; see fig. 2) to determine the correctness of the branch prediction (see col. 8, lines 18-25), and to conditionally update at least one of the plurality of entries in the dynamic branch predictor (see col. 10, lines 48-53 regarding updating the history table after branches are executed).

17. Regarding claim 13, Henry discloses the processor of claim 8 wherein the static branch predictor and the dynamic branch predictor are coupled to operate in a single pipeline stage (see above regarding claim 1).

18. Claim 14 recites equivalent limitations as claims 8 and 13 and is therefore rejected under the same grounds.

19. Claim 15 recites equivalent limitations as claim 3 and is therefore rejected under the same grounds.

20. Claim 16 recites equivalent limitations as claim 4 and is therefore rejected under the same grounds.

21. Claim 17 recites equivalent limitations as claim 10 and is therefore rejected under the same grounds.

22. Regarding claim 18, Henry discloses the processor of claim 14 wherein the dynamic branch predictor is configured to provide a branch prediction only when previous static predictions have been incorrect (see col. 10, lines 43-53).

*Note that if the static branch prediction had been previously incorrect, the table would show that the last time that branch was encountered, the executed branch disagreed with the static predictor. Therefore, the entry would indicate to the dynamic predictor to disagree the next time the branch is encountered. If the dynamic predictor agrees, the static (not the dynamic) prediction is provided.*

23. Claim 19 recites equivalent limitations as claim 11 and is therefore rejected under the same grounds.

24. Claim 20 recites equivalent limitations as claim 12 and is therefore rejected under the same grounds.



***Claim Rejections - 35 USC § 103***

25. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

26. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Henry in view of Gibson et al. (The Moron) herein referred to as Gibson.

27. Henry discloses the method of claim 1 wherein the dynamic branch prediction is performed by a dynamic branch predictor.

Henry does not expressly disclose having fewer than 16 entries.

Gibson teaches having fewer than 16 entries (8) in a branch predictor (see page 10, section 7, 3rd paragraph).

It would have been obvious at the time of the invention for one of ordinary skill in the art at the time of the invention to have modified the invention of Henry by using fewer than 16 entries, as taught by Gibson, in order to save processor space and power when program loops are not very deep (see page 10, section 7, 3rd paragraph).

28. Claim 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry in view of Radisic et al. (High-Efficiency Power Amplifier Integrated with Antenna) herein referred to as Radisic.

29. Regarding claim 21, Henry discloses an electronic system comprising a processor, the processor including a static branch predictor to statically predict whether a branch is taken or not taken based on a direction of the branch, and a dynamic branch predictor to conditionally override the static branch predictor (see above regarding claim 14).

Henry does not expressly disclose first and second antennas; an amplifier to amplify communications signals received by the first antenna.

30. Radisic teaches first (see section II) and second antennas (the transmitter must have an antenna); an amplifier to amplify communications signals received by the first antenna (see section III).

31. It would have been obvious at the time of the invention for one of ordinary skill in the art to have modified the invention of Henry by adding first and second antennas; an amplifier to amplify communications signals received by the first antenna, as taught by Radisic, in order to communicate with other devices without wires.

32. Claim 22 recites equivalent limitations as claim 4 and is therefore rejected using the same reasoning.

33. Claim 23 recites equivalent limitations as claim 11 and is therefore rejected using the same reasoning.

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34. Claim 24 recites equivalent limitations as claim 12 and is therefore rejected using the same reasoning.

35. Claim 25 recites equivalent limitations as claim 13 and is therefore rejected using the same reasoning.

### ***Conclusion***

36. The following is text cited from 37 CFR 1.11(c): In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse R. Moll whose telephone number is (571)272-2703. The examiner can normally be reached on M-F 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fritz M. Fleming can be reached on 571-272-4145. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JM 4/14/06

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4/14/2006